

Patent claims

1. Process for adjusting the fluid delivery volumes of a multi-channel metering apparatus with an arrangement of independently controlled dispensing channels 1.1-1.n delivering individual volumes of dispensing fluid to cavities 3.1.1-3.n.n, in the following procedural steps:
 - controlled delivery of individual volumes of dispensing fluid via dispensing channels 1.1-1.n where the control value is the same for all channels
 - measuring a variable relevant to the individual volumes delivered
 - correlating measurement values with the control value and the particular dispensing channel 1.1-1.n
 - determining a equilibration value from the measurement values and a permissible band of tolerance for measurement values
 - adjusting the control value up or down for every valve 2.1-2.n the dispensing channel 1.1-1.n for which has a correlated measurement value above or below the band of tolerance
 - memorizing channel control and measurement values as data storage groups
- 20 2. Process in accordance with claim 1, a feature of which is that each dispensing channel 1.1-1.n delivers a number of fluid volumes to various cavities 3.1.1-3.n.n and the mean value - correlated with the control value and the dispensing channel 1.1-1.n in each case - is formed on the basis of correlated measurement values.
- 25 3. Process in accordance with claim 1, a feature of which is that a median value for measurement values is used as a equilibration value.
- 30 4. Process in accordance with claim 1, a feature of which is that a mean value for measurement values is used as a equilibration value.

5. Process in accordance with claim 1, a feature of which is that a value relevant to the target volume is used as a equilibration value.
- 5 6. Process in accordance with claim 1, a feature of which is that the control value is the opening time $t_{1-t.n}$ for valves 2.1-2.n arranged in each of the dispensing channels 1.1-1.n.
- 10 7. Process in accordance with claim 1, a feature of which is that the control value is the plunger stroke of the pump connected to each of the dispensing channels 1.1-1.n.
- 15 8. Process in accordance with claim 1, a feature of which is that all stages of the process are completed many times in sequence in order to align dispensing channels 1.1-1.n on more than one delivery volume or tolerance band.
- 20 9. Process in accordance with claim 1, a feature of which is that further storage data such as dispensing fluid pressure, temperature and viscosity are added to storage data groups.
- 25 10. Multi-channel metering apparatus with an arrangement of dispensing channels 1.1-1.n for the delivery of individual volumes of dispensing fluid to cavities 3.1.1-3.n.n in a correlated arrangement, each having an independently controlled means of metering,
- 30 with a measuring device 4 to measure significant values $x_{1.1-x.n.n}$ for the volumes of dispensing fluid delivered to the individual cavities 3.1.1-3.n.n, correlated with the control value and the dispensing channel 1.1-1.n in each case and memorized (data storage groups) ,
a computer unit 5, which specifies an equilibration value on the basis of measurement values and adjusts all control values for channels the correlated measurement values for which are outside a tolerance band and on either side of the equilibration value,

a data input unit 6 connected to computer unit 5
and a control unit 7 which controls the means of metering in accordance with
the control values provided by computer unit 5.

Summary

Procedure for equilibration of the delivery volumes of a multi-channel metering apparatus with an arrangement of independently controlled dispensing channels

5 1.1-1.n, delivering individual volumes of dispensing fluid to cavities 3.1.1-3.n.n, where measured values relevant to the individual delivery volumes are measured for the same control value and from which an adjustment value is specified with a tolerance band and the control value is adjusted for dispensing channels 1.1-1.n, the measured values of which lie outside the tolerance band. The invention also

10 applies to an apparatus for implementing the procedure.

Fig.1